

Review Article

Management of Ischemic Stroke during cardiac catheterization: A case report and review of literature

Naoufal Chouaib*, Said Jidane, Mounir Lekhlit, Ahmed Belkouch, Tahir Nebhani, Saad Zidouh and Lahcen Belyamani

Department of Emergency, Military Training Hospital Mohamed V, Faculty of Medicine and Pharmacy, University Mohammed V, Rabat, Morocco

Introduction

Stroke following coronary interventions is a devastating and most dreaded complication with significant morbidity and mortality. Various factors have been ascribed for this complication including the technical errors [1]. A small percentage of strokes are iatrogenic, including those associated with invasive cardiac procedures. According to the literature, it is a rare complication of left heart catheterization [2]. Percutaneous coronary intervention is increasingly used to treat patients with diffuse atherosclerosis, acute coronary syndromes and even high-risk patients such as low ejection fraction [1]. The authors describe a patient who underwent percutaneous coronary intervention in the context of inferior infarction, which was complicated by ischemic stroke during cardiac catheterization.

Patient and Observation

A 60-year-old man, with a personal history of dyslipidemia, was admitted to hospital's emergency room with chest pain squeezing type, continuous, radiating to left shoulder. On admission, his pulse was 120 bpm, BP was 94/66mmHg. Rest of general examination was normal, and the admission electrocardiogram (ECG) revealed sinus rhythm with ST elevation in anterior segment. A brief echocardiogram showed no left ventricular hypertrophy, preserved global systolic function, and akinesia of septal wall and akinesia in apex and adjacent segments. We decided to perform urgent cardiac catheterization. Angioplasty showed acute occlusion of more than 20mm along the average anterior interventricular artery with the presence of an intraluminal thrombus at this level and absence of antegrade flow. The establishment of two stents at this artery was successful and resumed downstream revascularization. Immediate neurologic consultation showed that the patient was awake but aphasic, with poor verbal expression. Moderate

More Information

*Address for Correspondence: Chouaib Naoufal, Department of Emergency, Military Training Hospital Mohamed V, Faculty of Medicine and Pharmacy, University Mohammed V, Rabat, Morocco, Tel: 00212661321415; Email: naoufal_chouaib@hotmail.com

Submitted: 08 July 2019

Approved: 21 August 2019

Published: 22 August 2019

How to cite this article: Chouaib N, Jidane S, Lekhlit M, Belkouch A, Nebhani T, et al. Management of Ischemic Stroke during cardiac catheterization: A case report and review of literature. J Clin Intensive Care Med. 2019; 4: 040-041.

DOI: dx.doi.org/10.29328/journal.jcicm.1001024

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right hemiparesis was observed. The National Institutes of Health Stroke Scale (NIHSS) score was 3. An urgent cranial computed tomography (CT) scan was performed immediately due to suspicion of cerebral infarction. CT showed neither intracranial hemorrhage nor obvious parenchymal hypodensity, but spontaneous hyperdensity suggestive of occlusion of the right middle cerebral artery was observed, thus confirming the diagnosis of ischemic stroke. The decision not to thrombolysate was made. A repeat cranial CT scan 24 hours after confirmed a left temporal infarction. The NIHSS score was two days after. The patient was discharged after five days.

Discussion

Neurologic complications are infrequently associated with diagnostic cardiac catheterization, but may be devastating to the patient and the family. The reported frequency of clinically apparent stroke ranges from 0.03% to 0.38% [3-5], while the reported frequency of silent stroke may be much higher, up to 15.5%. The recent shift to more frequent catheterization of older patients with severe coronary disease has led to the need for more emphasis on the determination of risk factors for catheterization-associated cerebral infarction, as well as its prevention, rapid diagnosis and treatment.

Blumer was amongst the first to extensively discuss the importance of embolism as a complication of cardiac



infarction. He stated that mural thrombi are common following cardiac infarction, and that fragments may detach and produce embolic phenomena [1]. Strokes among patients with acute coronary syndromes enrolled in the Organization to Assess Strategies for Ischemic Syndromes (OASIS) I and II studies were associated with six-month mortality rates of 27% [6]. Routinely used thrombolytic agents and anticoagulants are associated with the cholesterol embolization syndrome [7]. Dukkupati, et al. found that cerebrovascular events were more common in patients with pre-existing hypertension, diabetes, and renal insufficiency [8]. Approximately one-third of all strokes occur within 24 hours following admission, whereas about two-thirds occur in the first week after the myocardial infarction [1]. Thrombolysis has been established as an effective treatment for acute ischemic stroke, but its benefit and risk for ischemic strokes specifically in the cardiac catheterization setting have not previously been investigated. Bleeding risks of thrombolysis might be increased after cardiac catheterization, owing to the recent invasive procedure and the concurrent administration of antithrombotic medications [9].

Antithrombotic medications administered during the cardiac catheterization procedure might influence the decision to treat with thrombolytics. Heparin, if associated with a prolonged a PTT, is a contraindication for intravenous rt-PA in the standard protocol [10]. However, heparin is routinely administered in intra-arterial thrombolysis cases. Therefore, intra-arterial rt-PA or mechanical revascularization might be a consideration in this situation, depending on the dose and timing of heparin received [9].

Conclusion

This case describes a rare complication who underwent percutaneous coronary intervention in the context of inferior infarction, which was complicated by ischemic stroke and discuss the problem of use thrombolytic agents and anticoagulants.

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